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Indian Standard

**SPECIFICATION FOR HIGH PRESSURE
CONNECTIONS FOR FUEL INJECTION
EQUIPMENT FOR DIESEL ENGINES**

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

Indian Standard

SPECIFICATION FOR HIGH PRESSURE CONNECTIONS FOR FUEL INJECTION EQUIPMENT FOR DIESEL ENGINES

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Indian Standard

SPECIFICATION FOR HIGH PRESSURE CONNECTIONS FOR FUEL INJECTION EQUIPMENT FOR DIESEL ENGINES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 September 1965, after the draft finalized by the Internal Combustion Engines Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 The high pressure connections are used for connecting the high pressure pipes between the fuel injection pump and the nozzle holder in diesel engines. The high pressure connections usually consist of connecting stud, cap nut, pressure washer and nipple ends of pipe.

0.3 In view of the fast developing industry manufacturing diesel engines in the country, it is felt that standards should be laid down for fuel injection equipment and its connecting parts. This standard is one of a series of Indian Standards being prepared on the subject. Other standards under preparation* in this series are:

- IS : 3170- Dimensions for injection nozzles, size 'S', for diesel engines
- IS : 3171- Dimensions for injection nozzle holders, size 'S', for diesel engines
- IS : 3172- Specification for banjo connections for fuel injection equipment for diesel engines
- IS : 3174- Specification for banjo bolts for fuel injection equipment for diesel engines
- IS : 3175- Specification for copper washers for fuel injection equipment for diesel engines

0.4 In this standard the dimensions for pressure pipe connections for fuel injection equipment have been specified in metric units. As an alternative, the dimensions of similar connections recommended by the Society of Motor Manufacturers and Traders (SMMT) of the U.K. have been specified.

0.5 In preparing this standard considerable assistance has been derived from DIN 73365-1951 Sheet 3 'Einspritzpumpen für Dieselmotoren';

Since printed

Druckrohranschlüsse (Fuel injection pumps for diesel engines, pressure pipe connections) ' issued by Deutscher Normenausschuss.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies the dimensions and other requirements for high pressure connections, such as connecting stud, cap nut, and nipple ends of pipe of Type A and Type B (SMMT Type); and pressure washer, used for connecting fuel injection equipment in diesel engines.

1.2 A typical assembly of a high pressure connection is shown in Table 1 (see P 6), which also gives suitable combination of different items according to their nominal sizes.

2. MATERIAL

2.1 The material for connecting stud and cap nut shall be low or medium carbon steel having minimum tensile strength of 60 kgf/mm² (see IS : 1570-1961†).

2.2 The material for pressure washers shall be unalloyed heat-treatable open-hearth or electric steel having carbon content of 0.57 to 0.65 percent and tensile strength of 70 to 80 kgf/mm² (see IS : 1570-1961†).

3. DIMENSIONS

3.1 The dimensions for connecting studs and cap nuts of Type A shall be as given in Table 2 (see P 7).

3.1.1 The dimensions and tolerances of threads for connecting studs and cap nuts of Type A shall conform to grades 8d and 8H respectively, as specified in IS : 1362-1962‡.

*Rules for rounding off numerical values (revised).

†Schedules for wrought steels for general engineering purposes.

‡Dimensions for screw threads for general purposes (diameter range 1.6 to 39 mm) (revised).

3.2 The dimensions for Type A and Type B nipple ends of pipes shall be as given in Table 3 (*see* P 8).

NOTE—The Type B nipple ends of pipes are suitable for SMMT type connections (*see* Table 5).

3.3 The dimensions for pressure washers shall be as given in Table 4 (*see* P 9).

3.4 The dimensions for Type B connecting studs and cap nuts for SMMT type connections shall be as given in Table 5 (*see* P 10).

3.4.1 The dimensions and tolerances of threads for Type B connecting studs and cap nuts shall conform to grades 8*d* and 8*H* respectively, as specified in IS : 1362-1962*.

4. DESIGNATION

4.1 The designation of connecting stud, cap nut, pressure washer and nipple ends of pipe shall indicate:

- a) commonly used name;
- b) type, if any;
- c) nominal size; and
- d) number of this standard.

The examples of designation of various items are given in the respective tables.

5. WORKMANSHIP AND FINISH

5.1 The high pressure connections, such as connecting stud and nipple ends of pipe shall be free from cracks, rust or burrs.

6. SAMPLING AND CRITERIA FOR CONFORMITY

6.1 Unless otherwise agreed to between the manufacturer and the purchaser, the sampling scheme and criteria for conformity with this standard shall be followed as laid down in IS : 2614-1964†.

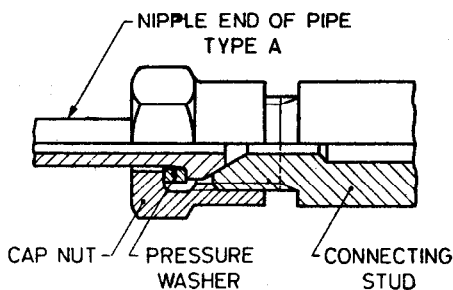
*Dimensions for screw threads for general purposes (diameter range 1.6 to 39 mm) (*revised*).

†Methods for sampling of fasteners. (Since revised).

TABLE 1 ASSEMBLY OF HIGH PRESSURE CONNECTIONS

(Clause 1.2)

All dimensions in millimetres.

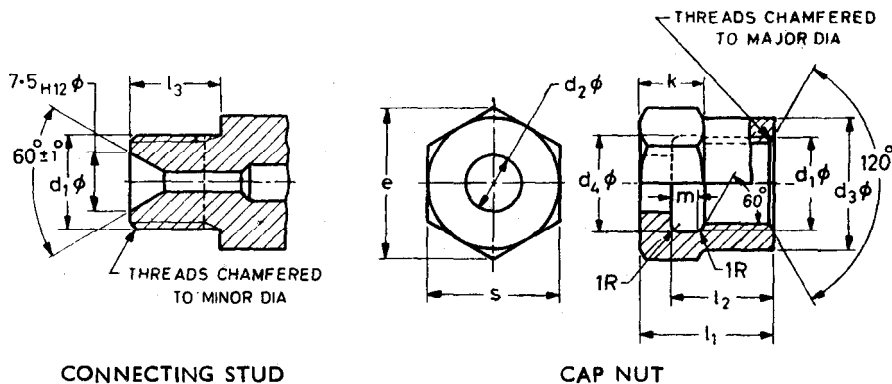


NOMINAL SIZE	THREADS FOR CONNECTING STUD	OUTSIDE DIAMETER OF PIPE	NOMINAL SIZE OF CAP NUT	NOMINAL SIZE OF PRESSURE WASHER	NOMINAL SIZE OF NIPPLE ENDS OF PIPE	
					Type A	Type B
12	M12 × 1.5	6	12	10	A6	B6
14	M14 × 1.5	6	14	12	A6	B6
18	M18 × 1.5	8	18	16	A8	B8

TABLE 2 DIMENSIONS FOR TYPE A CONNECTING STUDS AND CAP NUTS

(Clause 3.1)

All dimensions in millimetres.



NOMINAL SIZE OF CON- NECTING STUD OR CAP NUT	NOMINAL SIZE OF THREADS d_1	d_2 H12	d_3 h12	d_4 H13	e (Approx)	k	l_1 h14	l_2 H12	l_3 +0.5	m	s	TOL ON s
12	M12 × 1.5	7.1	16	12.5	19.6	8	17	13	11.5	3	17	-0.2
14	M14 × 1.5	8.4	18	14.5	21.9	9	19	15	13	3	19	-0.25
18	M18 × 1.5	10.5	22	18.5	25.1	12	27	22	15	5	22	-0.3

Designation :

A cap nut of Type A having nominal size 14 shall be designated as:

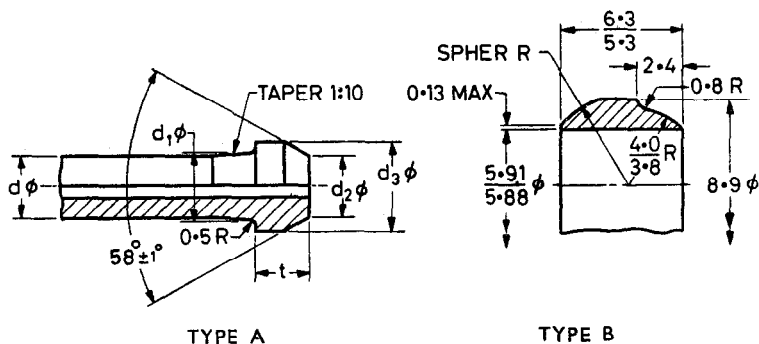
Cap Nut A14 IS : 3173

NOTE — Dimensions not given are to be chosen suitably.

**TABLE 3 DIMENSIONS FOR TYPE A AND TYPE B (SMMT)
NIPPLE ENDS OF PIPES**

(Clause 3.2)

All dimensions in millimetres.



NOMINAL SIZE OF NIPPLE END OF PIPE d	d_1 h10	d_2 h11	d_3 h11	t ± 0.2
6	6.3	6	9	5
8	8.5	7	11.5	7

Designation:

A nipple end of pipe of Type A having a nominal size $d=6$ mm shall be designated as:

Nipple End of Pipe A6 IS: 3173

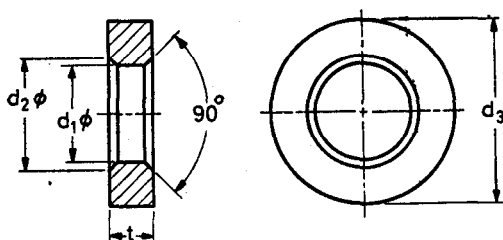
NOTE 1 — Type B nipple ends of pipes are used with SMMT connections.

NOTE 2 — Dimensions not given are to be chosen suitably.

TABLE 4 DIMENSIONS FOR PRESSURE WASHERS

(Clause 3.3)

All dimensions in millimetres.



NOMINAL SIZE OF PRESSURE WASHER	d_1 H11	d_2	d_3 h11	t	TOL ON t
10	6.2	7.2	10	2.8	h14
12	6.2	7.2	12	2.8	h14
16	8.2	9.2	15.8	7.0	h13

Designation:

A pressure washer of nominal size 12 shall be designated as:

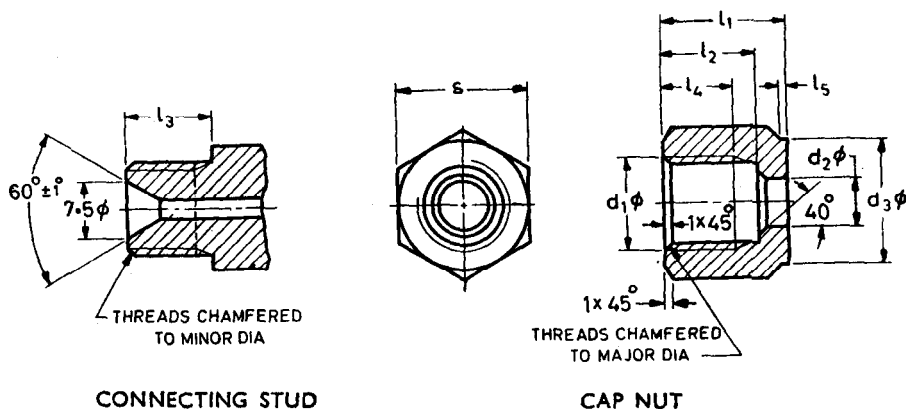
Pressure Washer 12 IS : 3173

NOTE — Dimensions not given are to be chosen suitably.

TABLE 5 DIMENSIONS FOR TYPE B (SMTT TYPE) CONNECTING STUDS AND CAP NUTS

(Clause 3.4)

All dimensions in millimetres.



NOMINAL SIZE OF CONNECTING STUD OR CAP NUT	NOMINAL SIZE OF THREADS d_1	d_2		d_3		l_1	l_2	l_3	l_4	l_5	s	TOL ON s
		Max	Min	Max	Min				Min			
12	M12 x 1.5	6.6	6.4	15.9	15.6	16	12	11.5	9	0.8	17	-0.2
14	M14 x 1.5	6.6	6.4	15.9	15.6	16	12	13	9	0.8	19	-0.25

Designation:

A cap nut of Type B having a nominal size 12 shall be designated as:

Cap Nut B12 IS : 3173

NOTE — Dimensions not given are to be chosen suitably.

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